Beverly and Kaminuriak Caribou

Monitoring and Land Use Controls 1980

Wildlife Service

Progress Report Number 4

BEVERLY AND KAMINURIAK CARIBOU

MONITORING AND LAND USE CONTROLS

1980

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1981

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ABSTRACT

Beverly and Kaminuriak caribou herd movements were monitored from 12 May to 31 July, 1980 in relation to Caribou Protection Areas and land use activities. The Caribou Monitor advised DIAND land use personnel on caribou distribution in specific areas for land use activities. Aerial reconnaissance was the main monitoring method used. An early spring caused the Beverly herd to migrate early; the caribou cows approached their calving ground north of Sand Lake by late May. During calving in early to mid June the total Beverly herd population was estimated to be 97,000 caribou. Following the calving period, caribou moved into the Thelon Game Sanctuary, leaving the Caribou Protection Area devoid of large groups. The Caribou Protection Areas were opened for mineral exploration by late July. Many animals remained scattered over the broad summer ranges, both within and outside the Caribou Protection Area. The Beverly herd area contained the preponderance of mineral-related land use activity in 1980 in the Baker Lake District.

Kaminuriak cows calved in a small area near Kaminuriak Lake. A calving ground census estimated the total Kaminuriak population to be about 39,000 caribou. Caribou cows had largely left the Caribou Protection Area by the end of June, heading southeast toward Eskimo Point. From there, they spread out, many moving west and north around the perimeter of the Caribou Protection Area, and probably many going south. There was limited land use activity on their summer range. It was felt that the monitoring program, coupled with land use controls, significantly reduced the potential for conflicts between caribou and mineral exploration land use activities.

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INTRODUCTION

To facilitate the implementation of land use regulations, the Caribou Monitoring Program was continued in 1980 on the calving and post-calving grounds of the Kaminuriak and Beverly caribou (Rangifer tarandus groenlandicus) herds. Previous operating conditions applied to land use activities in relation to caribou are outlined in prior reports of the Caribou Monitoring Program (Darby 1979, 1980).

The purpose of the Caribou Monitoring Program is to advise DIAND (Department of Indian Affairs and Northern Development) on the implementation of the Caribou Protection Measures (Appendix 1) by monitoring the spring and summer movements of the Beverly and Kaminuriak caribou herds. Land use regulations are used to protect the caribou from 15 May to 31 July within, and adjacent to, two Caribou Protection Areas (Fig. 1), which encompass the known historical calving and post-calving grounds of the Beverly and Kaminuriak herds. The goal of land use regulation is to minimize or eliminate human disturbance of caribou during calving and post-calving periods when they are particularly vulnerable.

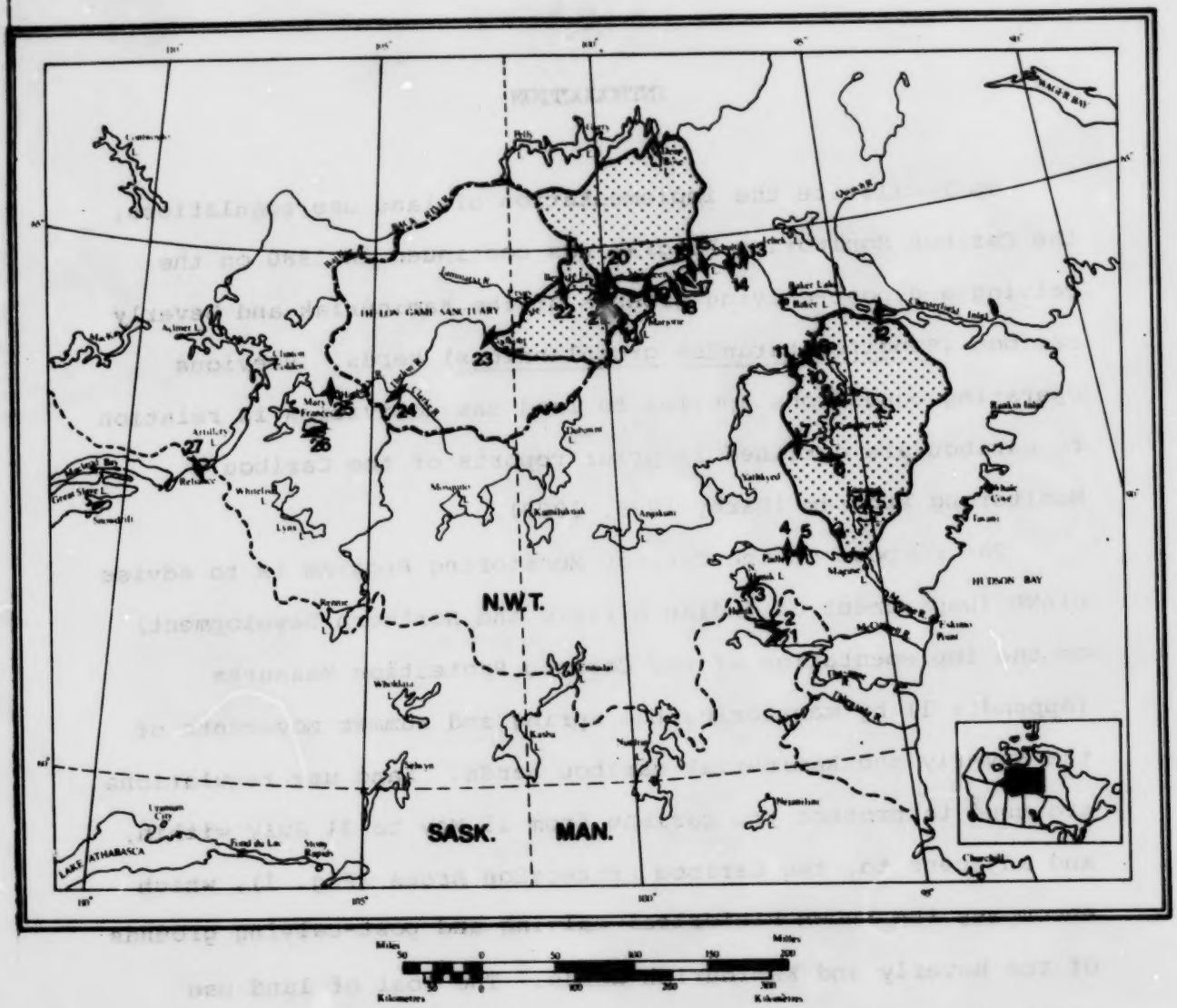

Fig. 1. Map of Caribou Protection Areas - 1980.

The emphasis of the 1978 and 1979 Caribou Monitoring Programs was placed on monitoring the movements and distribution of both herds throughout their summer range in the N.W.T. The emphasis in 1980 was directed at advising DIAND of caribou distribution and movements and potential land use/caribou interactions in or near the Caribou Protection Areas (Fig. 1). Less emphasis was placed on recording movements of bull and non-breeding groups, and on monitoring water crossings. Information gathered from the 1978 and 1979 Caribou Monitoring Programs and from previous studies of the two herds facilitated a pre-survey delineation of calving ground, movement patterns, and traditional water crossings.

This report summarizes spring and early summer movements of caribou in relation to the 1980 Caribou Protection Areas with a description of the interactions between the mineral exploration companies, the DIAND Land Use Section, and the Caribou Monitor.

METHODS

Caribou Monitoring Program

The study area extended from Great Slave Lake east to Hudson Bay and from about 59°N to 66°N (Fig. 2). A Caribou Monitor, based in Baker Lake, ascertained the distribution and movements of caribou through periodic aerial reconnaissance flights. The survey data was then forwarded to DIAND Land Use Inspectors at Baker Lake and Rankin Inlet. In addition, the Monitor made recommendations to DIAND regarding the regulation of exploration activity. The recommendations were based on documented historic caribou movement patterns, contemporary data, and resulting predictions of caribou movements. DIAND acted on the advice of the Caribou Monitor by initiating or maintaining openings (releases) or closures of areas for land use activity.

The Caribou Monitoring Program was conducted from 15 May until 31 July; this is the critical period during which cows undertake spring migration, calving, and post-calving movement.

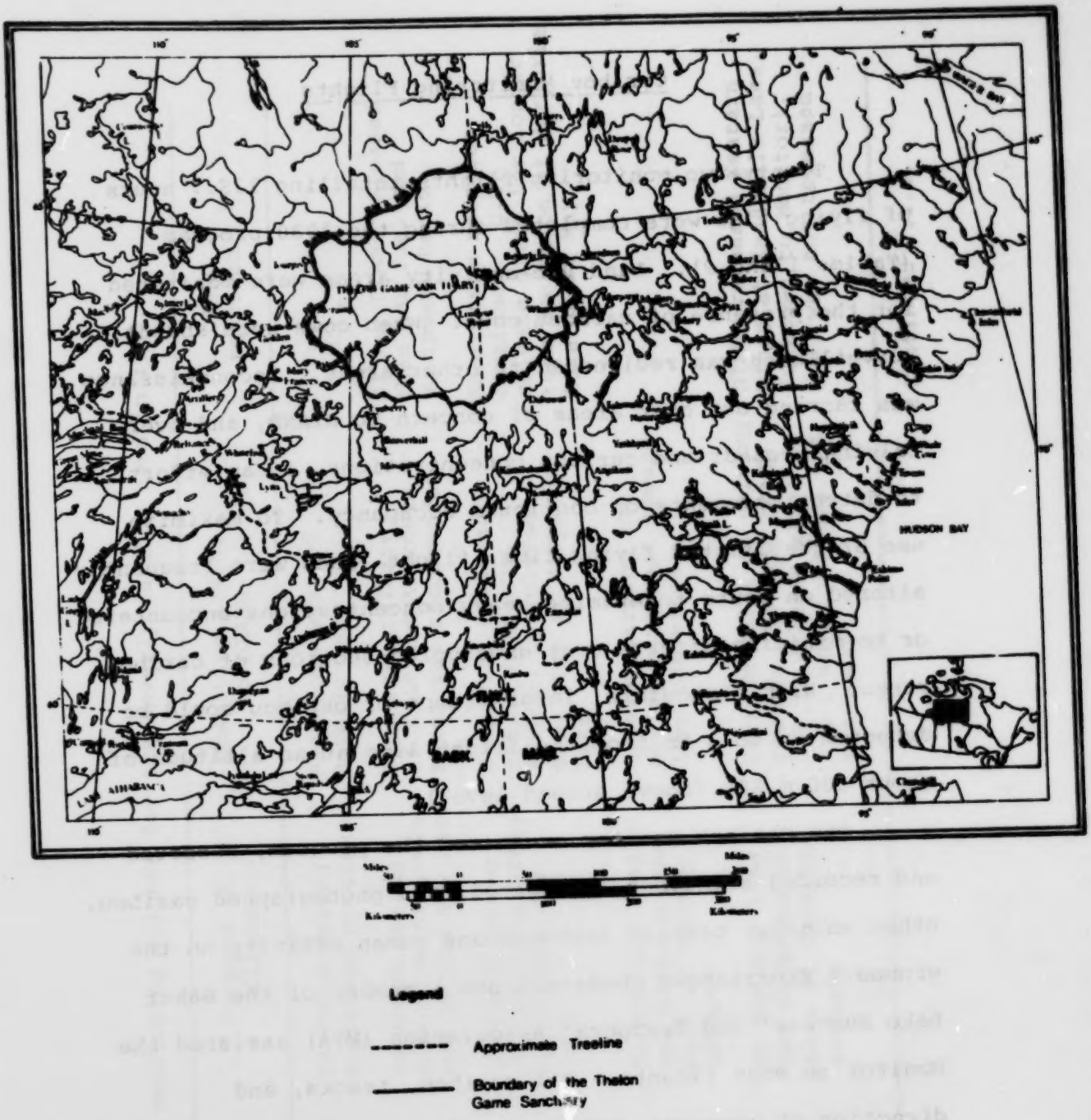

Fig. 2. The study area of the 1980 Caribou Monitoring Program.

Caribou Monitoring Flights

Twenty-two monitoring flights totalling 115.7 hours of flying time were completed during the 1980 program (Tables 1 and 2). Land use activity areas were monitored for the presence of caribou cows. When cows were absent, surveillance was redirected to other areas. Reconnaissance was carried out over areas of concern to DIAND, and over calving grounds and caribou concentrations, in an effort to detect movements or continued occupancy. To maximize use of the limited flying time, flight lines were frequently altered en route to examine heavy concentrations encountered, or to minimize efforts over unoccupied sections of caribou range. With binoculars, large groups of caribou could be detected up to 3 km from the flight line at an altitude of about 300 m AGL (above ground level).

The Caribou Monitor organized the program, observed and recorded sightings, navigated, and photographed caribou, other animals, terrain features and human activity on the ground. Experienced observers and a member of the Baker Lake Hunters' and Trappers' Association (HTA) assisted the Monitor on most flights. All caribou, tracks, and direction of movement were recorded. During each flight, observations were recorded on 1:250,000 scale maps or on a tape recorder.

Table 1. Caribou monitoring flights for the Beverly caribou herd in 1980.

Date flown	Hours flown	Purpose of flight	Resulting advice to DIAND	DIAND reaction
May 12	4.4	To check spring migration progress	Many cows west of Beverly Lake	
May 21	7.0	To check spring migration progress and locate cow herd	Temporary release of Sand and Aberdeen Lakes was recommended	23 May DIAND released them for fuel and equipment hauls
May 25	5.9	To check spring migration progress and locate cow herd	Temporary releases should continue. Advised to release U.G. site at Marjorie Lake	Short term releases continued. U.G. release given for longer term operation at Marjorie Lake on 26 May
June 11	3.7	To monitor land use sites south-east of calving grounds	Calving caribou not moving southeast toward land use sites	
June 14	1.8	To monitor land use sites south-east of calving grounds	Caribou still on calving ground. Advised DIAND not to release sites to U.G., Western Mines and Texasgulf	DIAND released Western Mines at Sandhills Lake, (unknown to Monitor). U.G. was not released

Continued .....

Table 1. (Continued)

Date flown	Hours flown	Purpose of flight	Resulting advice to DIAND	DIAND reaction
June 20 and 23	7.0	To monitor post-calving movements relative to land use sites	Herd still on calving ground. Advised no releases be granted	DIAND released U.G. to haul camp to east of Sandhills Lake
June 26	6.6	To monitor post-calving movements relative to land use sites	Advised to release Western Mines and U.G. east of there, no releases for Sand Lake or Texasgulf site	DIAND released U.G.
July 7	6.2	Monitor cow movements relative to land use sites	Advised to release Sand Lake but not Texasgulf or Union Oil sites until further monitoring	DIAND released Sand Lake, withheld release of Texasgulf and Union Oil
July 9	8.4	Monitor Texasgulf and Union Oil sites and to locate cow herd	Advised caribou herd left Caribou Protection Area. Release of two sites advised.	DIAND released sites in Caribou Protection Area. All open now

Continued .....

Table 1. (Continued)

Date flown	Hours flown	Purpose of flight	Resulting advice to DIAND	DIAND reaction
July 24 and 25	7.6	To locate caribou herd and map movements	Caribou moved far south of Thelon Game Sanctuary	Maintained all releases
July 31	12.6	To locate caribou herd and map movements	Early southward migration toward tree line by much of Beverly herd	Maintained all releases
Total	71.2			

Table 2. Caribou Monitoring flights for the Kaminuriak Caribou herd in 1980

Date flown	Hours flown	Purpose of flight	Resulting advice to DIAND	DIAND reaction
May 12	1.4*	To check spring migration and Pan Ocean Oil Ltd. land use site	No immediate conflict	Wait for more information
May 14	3.9	To check spring migration and monitor Pan Ocean site	Caribou not approaching Pan Ocean. Advised to release it	15 May Pan Ocean released
May 27	1.8	To check spring migration and monitor Pan Ocean site	No change	
June 1	1.7	Monitor Pan Ocean site and check spring migration progress	No change	
June 17	5.0	Monitor Pan Ocean site and locate the cow herd	Caribou moving southeast, away from Pan Ocean site	Maintained release for Pan Ocean
June 27	3.3	Monitor Pan Ocean site	No cows near Pan Ocean, but 8,000 bulls at the site	Maintained release but cautioned Pan Ocean about disturbance to caribou

Continued .....

Table 2. (Continued)

Date flown	Hours flown	Purpose of flight	Resulting advice to DIAND	DIAND reaction
July 2	3.0**	Monitor Pan Ocean site	Bulls left area. No site conflict with cows	Maintained release
July 14	8.1	Monitor land use sites, locate cow herd, and determine their movements	No conflict with Pan Ocean site; herd not located but known to be south of Caribou Protection Area (C.P.A.)	
July 17	9.3	Monitor land use sites, to locate cow herd and determine their movements	Cows and bulls moving along west side of C.P.A. well away from active land use sites. Advised Noranda site be released	July 18 DIAND released Noranda site
July 29	7.0	To locate herd and determine their movements	11,000 caribou near Ferguson Lake. No conflicts	
Total	44.5			

* 12 May flight aborted due to fog.

** DIAND helicopter used.

The monitoring aircraft was a DeHavilland Beaver; DIAND's Hughes 500 Helicopter was used once. The Beaver was on wheel-skis until 27 June, which facilitated landings on lake ice for refuelling. After 7 July, the aircraft was float-equipped. Wing-tip tanks were filled and 10 gallon kegs were stowed to increase the flight range to over 7 hours. Aviation fuel caches in the monitoring areas occasionally were used (Appendix II). A survey altitude of 300 m AGL was maintained; occasional descents to about 150 m AGL were made in order to segregate pre-calving groups. During post-calving periods calves were used to indicate the presence of cows. Bulls were distinguished by advanced antler growth and molting. After the molt, caribou in dark summer pelage blend in with the tundra making aerial spotting more difficult.

Maximum flying speed was 180 km/hr with wheel-skis and 160 km/hr with floats. This speed was reduced when it was necessary to photograph or estimate numbers in large concentrations of caribou. Actual counts were not possible, but visual estimates of group sizes were made.

Migrating caribou erode trails which are easily visible from the air, particularly on moist ground, snow, or on new vegetation growth such as wet sedge meadows.

Ground checks of the trails made it possible to determine the location of cow-calf cohorts, the direction of migration, and the approximate date of passage and size of the group. All fresh trails of significant size were plotted from the air on 1:250,000 flight maps at their point of intersection with the transect lines. Some heavily used trails were followed to determine the location of the caribou.

Monitoring Assistance From Other Programs

Calving Ground Census Program

Calving began during the first week of June. At this time, N.W.T. Wildlife Service biologists, A. Gunn, R. Decker and D. Heard flew extensive surveys of the Beverly and Kaminuriak calving rounds (Table 3). They mapped the calving ground boundaries and censused animals after searching the surrounding terrain for other calving grounds. This information was used to advise DIAND on land use/caribou interactions.

Table 3. Flights by other programs assisting caribou monitor in 1980.

Date flown	Hours	Program	Information obtained
May 31	1.9	N.W.T. Wildlife Service calving ground census (K)	No caribou at north end of Kaminuriak area including land use sites.
June 1	1.5	Calving ground census (B)	Preliminary reconnaissance of Beverly herd. Calving ground located.
June 2	7.4	Calving ground census (B)	Reconnaissance. West and south boundaries of calving ground located.
June 2	3.0	Calving ground census (K)	Reconnaissance to locate Kaminuriak calving ground. Unsuccessful.
June 3	3.0	Calving ground census (K)	Reconnaissance. East boundary of Kaminuriak calving ground located.
June 3	4.8	Calving ground census (B)	Reconnaissance. North and east boundary of Beverly calving ground located.
June 5	9.0	Calving ground census (B)	Systematic reconnaissance of Beverly calving ground.
June 6	5.5	Calving ground census (B)	Census of Beverly calving ground partly completed. Movements noted.

Continued .....

Table 3. (Continued)

Date flown	Hours	Program	Information obtained
June 8	13.2	Calving ground census (B)	Census of Beverly calving ground completed. Herd movements and location monitored.
June 13 and 14	9.7*	Calving ground census (B)	Herd segregation counts completed. Supplementary census.
July 12	3.0	N.W.T. Wildlife Service calving ground vegetation study (B)	Negative data gathered on caribou along Thelon River, and west of calving ground. Trails near Baillie River located.
July 23	7.0*	N.W.T. Wildlife Service Water Crossing Study (K)	Kaminuriak caribou trails located and inspected. 7,100 caribou near Padlei located.
Total	69.0		

(K) Flights to monitor the Kaminuriak caribou herd.

(B) Flights to monitor the Beverly caribou herd.

* Helicopter used, all others fixed-wing aircraft.

Caribou Disturbance Studies

M. Williams (N.W.T. Wildlife Service) contributed observations of caribou groups and important caribou trails while conducting a preliminary caribou water crossing study (Table 3). He also observed on monitoring flights. Some flights were shared between the two programs.

S. Fleck (N.W.T. Wildlife Service) observed caribou movements from the air and on the ground while conducting vegetation studies on the Beverly calving ground near Sand Lake (Table 3). S. Fleck and A. Gunn also assisted as observers on some monitor flights.

Interviews

Interviews with Inuit hunters, DIAND Land Use Inspectors, Wildlife Officers, pilots, biologists, canoeists, and mineral exploration company personnel supplemented the findings of the monitoring program by providing much information on caribou distribution and movements.

Reporting to DIAND

Caribou monitoring flights (Tables 1 and 2) and relevant flights completed for other programs (Table 3) were summarized on a standard flight report form (Appendix III) and observations were plotted on 1:250,000 scale maps. The reports are on file at the N.W.T. Wildlife Service Headquarters, Yellowknife. Results were also summarized on DIAND flight report forms with a large scale map (1:1,000,000). These were submitted to the DIAND Land Use Inspectors in Baker Lake and Rankin Inlet.

Following each flight, in conjunction with the various recommendations submitted, communication with DIAND personnel enabled the Caribou Monitor to keep abreast of mining exploration plans and activities.

Three monthly summaries of cow-calf distributions in relation to the boundaries of the Caribou Protection Areas were submitted to DIAND personnel in Rankin Inlet and Yellowknife during the course of the summer.

RESULTS AND DISCUSSION

Beverly Caribou Herd Movements and Distribution

Spring Migration Toward the Calving Ground

Little data were gathered during the 1980 Beverly caribou spring migration. R. Catling, a trapper living north of Jim Lake (62°24'N, 104°35'W), reported that the herd vanguard moved north between Beaverhill and Mosquito Lakes in late April (R. Decker pers. comm.). These lakes are located south of the Thelon Game Sanctuary.

Caribou migrated north to the Thelon River (Fig. 3), where intensive crossing activity occurred at Lookout Point prior to 12 May. Caribou cow groups moved north past the Ursus Islands in the Thelon River from early May until after 25 May. Concentrations of caribou were observed on the tundra immediately southeast of Ursus Islands by 12 May, when the Thelon River was free of ice. Those caribou eventually crossed the river between Ursus Islands and Beverly Lake as others moved in from the southeast. By 2 June, groups of bulls were observed near the Ursus Islands; cows were now on the calving ground.

Spring was 2 - 3 weeks earlier than usual on the Beverly range this year. Kelsall (1968) suggested that cows normally reach treeline during the first week of May. The Thelon River crossing near Ursus Islands is approximately 430 km beyond the treeline at Rennie Lake (Fig. 2) and some caribou had crossed here by 12 May. The 1980 spring migration was not apparently hampered by wet snow or poor ice conditions because melting was advanced in early May.

Beverly Herd Calving Period and 1980 Calving Ground

Beverly cows moved north to Consul River at the northeast end of the Thelon Game Sanctuary and then east to the calving ground in late May. The 1980 calving ground was an elongated area running from Deep Rose Lake southwest to beyond the Consul River, an area of 5,288 km^2 (Fig. 3). Caribou density was approximately 15 caribou/km^2 on the eastern half of the calving ground and approximately 2 caribou/km^2 on the western portion (A. Gunn pers. comm.).

Bulls and non-breeding caribou subsequently followed the Beverly cows along similar migration routes past Ursus Islands and the Tammarvi River, located within the Thelon Game Sanctuary. At calving time, those animals occupied an area of undetermined size, mixing with the cows at the southwest end of the calving ground.

Beverly cows entered the Caribou Protection Area after 25 May and were on the calving ground by 3 June. About 80% of the 1980 calving ground was located inside the Caribou Protection Area; the southwest end fell within the Thelon Game Sanctuary. Early thawing and subsequent early migration allowed sufficient time for cows to approach the northern calving ground prior to calving.

Most Beverly calves were born between 6 and 13 June. N.W.T. Wildlife Service biologists conducted a census on the calving ground on 6 and 8 June and estimated a calving ground population of 43,000 (A. Gunn pers. comm.). The total population was estimated

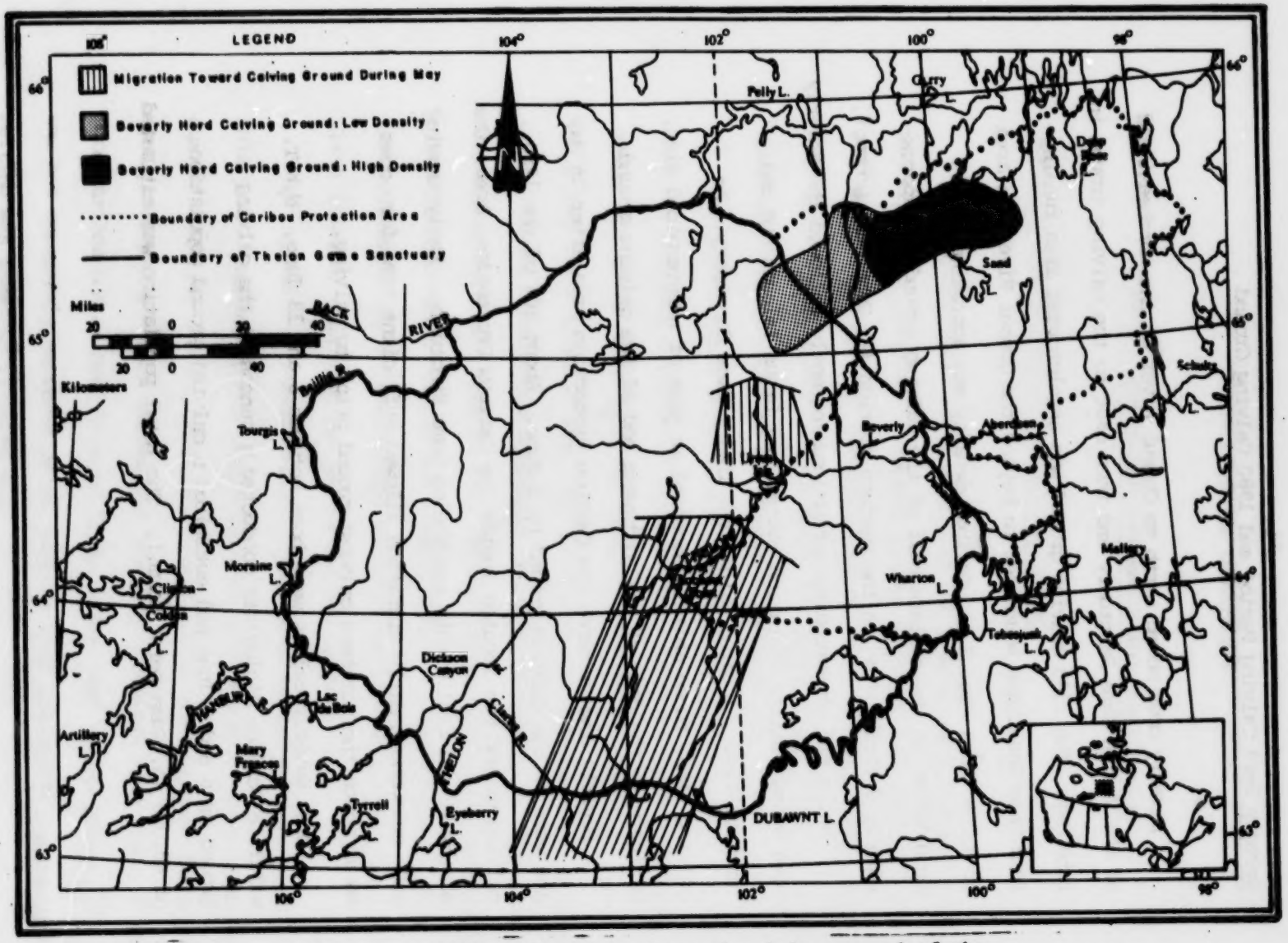

Fig. 3. 1980 spring migration and calving ground of the Beverly cow herd.

to be 97,000 animals (Heard 1980a). Segregation counts were made on 13 and 14 June on the calving ground. At that time caribou were aggregated into groups ranging in size from 100 to 500 adults.

Beverly Herd Post-Calving Period Movements

Movements within the Caribou Protection Area:

After calving and throughout June caribou gradually moved off the eastern half of the calving ground. Caribou in the western half formed post-calving aggregations of up to 4,000 animals, but most groups contained between 150 and 500 adults.

The main Beverly caribou herd moved out of the Caribou Protection Area by 7 July; they migrated southwest toward the center of the Thelon Game Sanctuary. A small segment recrossed the southwest corner of the Caribou Protection Area after crossing the Thelon River between Thelon Bluffs and Lookout Point (Fig. 4).

A few small groups and solitary animals remained scattered throughout the Caribou Protection Area during the post-calving period. There were no interactions between caribou cows and land use activities in the Caribou Protection Area.

Throughout July and early August, individuals and small groups of caribou were observed by canoeists, Inuit hunters, and mineral exploration personnel along the shores of Beverly, Aberdeen and

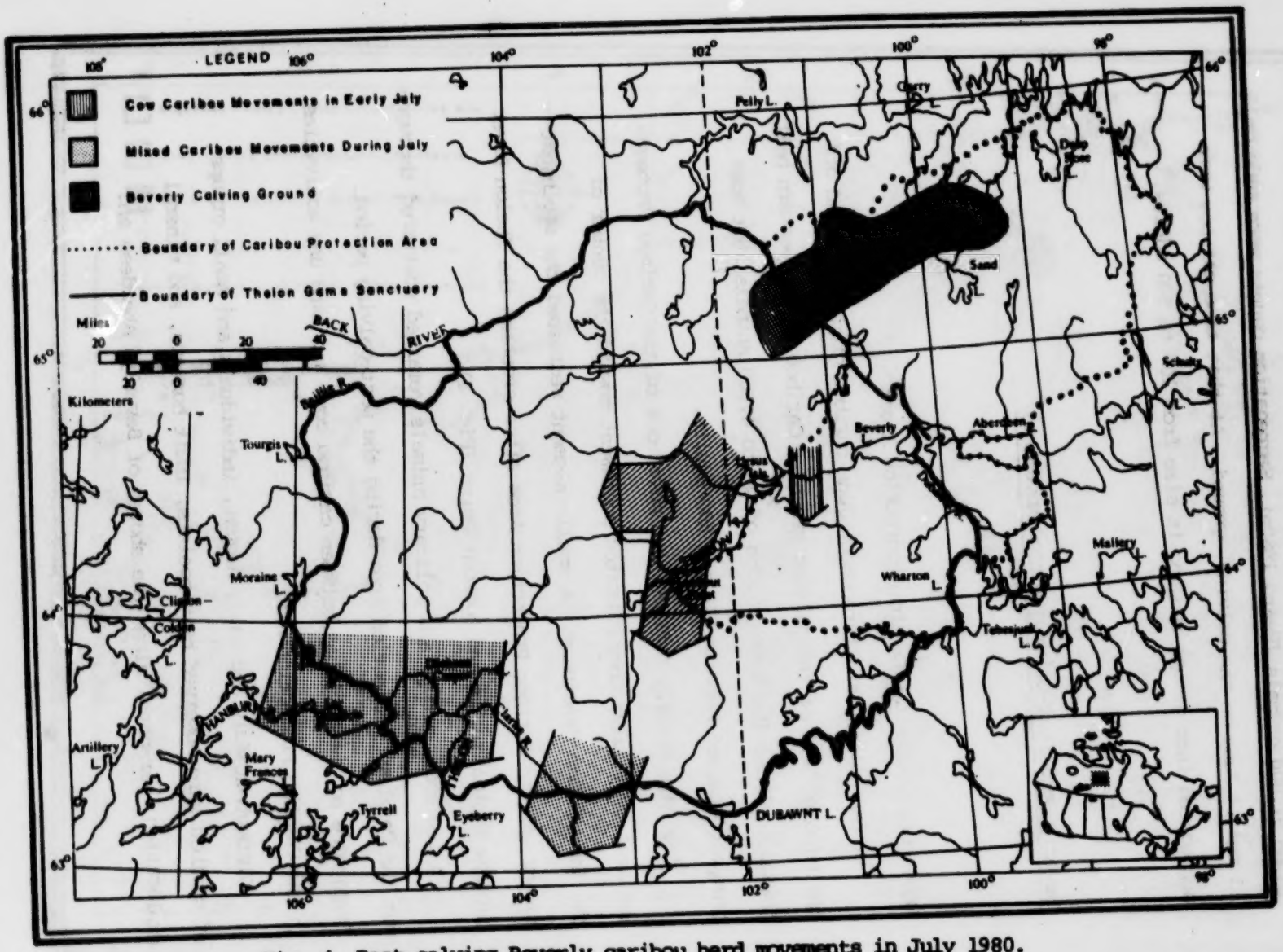

Fig. 4. Post-calving Beverly caribou herd movements in July 1980.

Schultz Lakes. One group of over 100 caribou, with a preponderance of cows and calves, was observed moving west along the northwest corner of Aberdeen Lake on 8 August (J. Bubier pers. comm.). Another group of about 60 cows and calves crossed to the south at designated water crossing #15 (Fig. 1) on the Thelon River west of Schultz Lake on 6 August (J. Pangman pers. comm.). Various individual sightings suggested that several thousand caribou were scattered over the Caribou Protection Area during July and August.

Movements within the Thelon Game Sanctuary:

Post-calving movement was directly toward the Thelon Game Sanctuary. Prior to 9 July, the majority of Beverly caribou cows and calves moved south and southwest, crossing the lower 33 kilometers of the Tammarvi River. Well-marked trails were formed in the new sedge growth as a result of this movement. A small segment of the cow herd crossed the Thelon River east of Ursus Islands (Fig. 4). Subsequently, most caribou dispersed to the west across the tundra north of the Thelon and Hanbury Rivers as far as Sifton Lake (63°45'N, 106°33'W) in the west and perhaps to the Back River in the north. Cow and bull groups mixed at this time. They moved to the south through the Thelon Game Sanctuary in early to mid July. Abundant fresh trails crossing the Thelon and Hanbury Rivers were mapped during monitoring flights. Some water crossings on the river

systems were heavily used, particularly those at Lookout Point, Grassy Island (63°46'N, 104°22'W) and along most of the Hanbury River below Sifton Lake (Fig.4).

This early southward movement by a large portion of the population was unusual. At the end of July 1979, the Beverly herd was located north of the Thelon River within the Thelon Game Sanctuary (Darby 1980). Similar southward movements in 1978 were several weeks later than those in 1980 (Darby 1979, 1980).

The remainder of the Beverly herd dispersed between Aberdeen Lake and Artillery Lake in late July and early August, 1980. Some groups of 3,600 crossed the Thelon River 33 km below Hornby Point about 24 July, and more than 300 animals were observed crossing the Hanbury River near Cruikshank Lake (63°32'N, 105°21'W) on 22 July. Many solitary animals, primarily bulls, grazed in the western portions of the summer range.

Movements south of the Thelon Game Sanctuary:

By mid-July most caribou were south of the Thelon Game Sanctuary.

Trails indicated that most of the caribou passed west of Dubawnt Lake, with many passing west of the Thelon River at Eyeberry Lake (63°08'N, 104°43'W). Most groups passed the Lynx Lake area between 15 and 20 July.

Travel was along a front from Whitefish Lake (69°22'N, 133° 34'W) east to Mary Lake (62°24'N, 103°31'W) which is south of Sid Lake (62°16'N, 104°04'W). Infrequently, they travelled as far east as Kaminuriak Lake (63°00'N, 95°40'W).

A large proportion of the Beverly herd reached the treeline by the end of July. Since no monitoring flights were conducted south of Lynx Lake the number of caribou and their destination was not determined.

Kaminuriak Caribou Herd Movements and Distribution

Spring Migration toward the Calving Ground

Kaminuriak cows approached the calving ground, located east of Kaminuriak Lake, from the southwest in early May, 1980. Most of the cow herd was concentrated on the snow-covered tundra near Kaminuriak Lake by 14 May. Groups containing up to 500 caribou were densely distributed along 25 km of the lake's northwest shore between 63°07'N and 63°19'N at approximately 95°35'W. Hundreds of animals were also found east of Kaminuriak Lake on 14 May. Throughout May, there were only localized caribou movements.

Kaminuriak Herd Calving Period and 1980 Calving Ground

At calving time in early June, a majority of the cows occupied a calving ground stretching from the east shore of Kaminuriak Lake east to Townsend (62°42'N, 95°21'W), Mandeville and Duffy Lakes (Fig. 5). A few hundred animals calved on the southwest shore at the mouth of the Ferguson River. From a census conducted on 3 and 4 June, 1980, the calving ground population was estimated to be 20,000 animals; the total population was estimated at 39,000 caribou (Heard 1980b). The 1980 calving ground covered approximately 1,000 km^2.

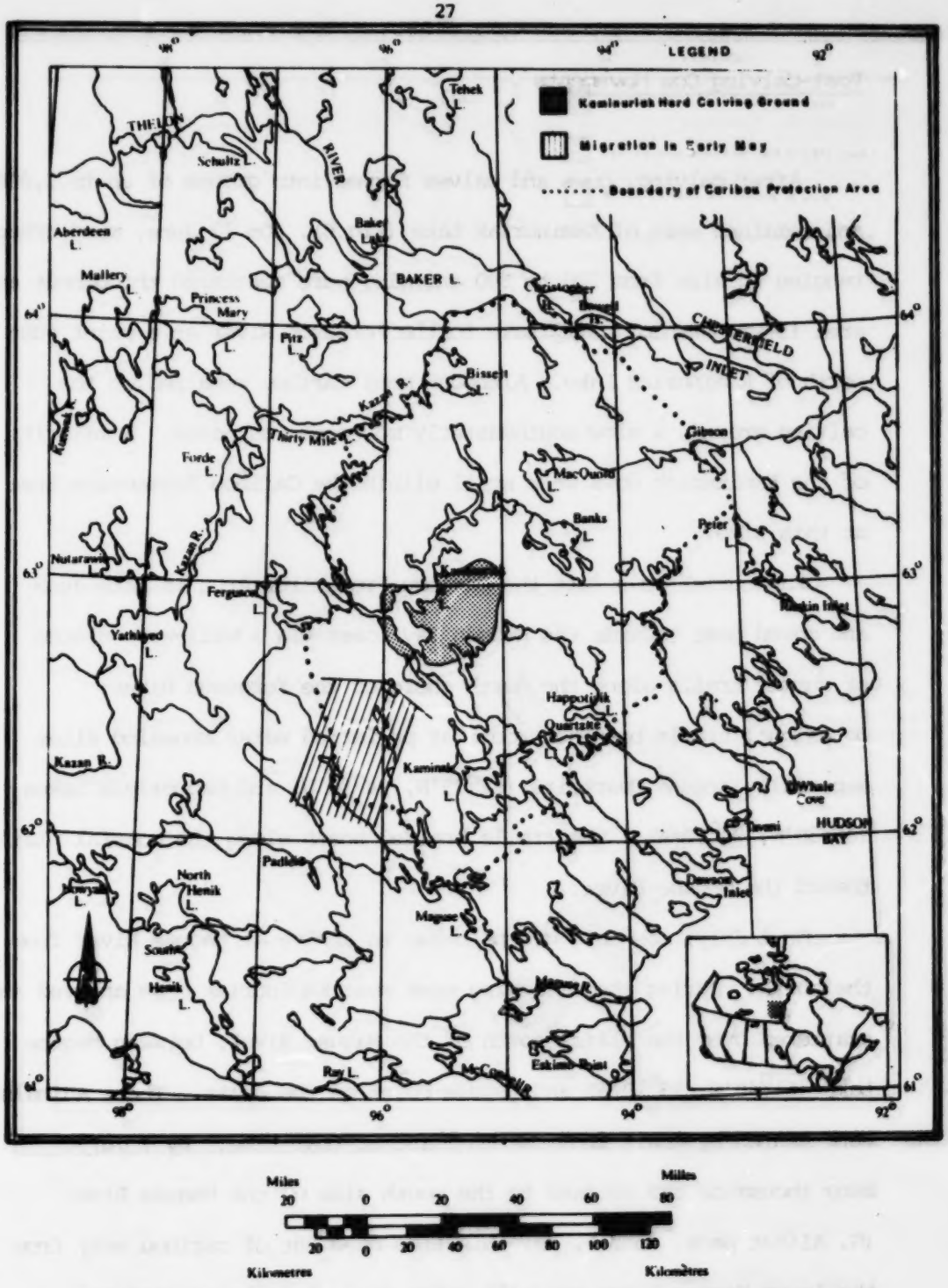

Fig. 5. 1980 spring migration and calving ground of the Kaminuriak caribou herd.

Post-Calving Cow Movements

After calving, cows and calves formed into groups of up to 1,000 and remained east of Kaminuriak Lake (Fig.6). On 17 June, many groups, ranging in size from 200 to 500 animals, were scattered throughout an area 15 km north of Duffy Lake to the Ferguson River at a point just north of Kaminuriak Lake. Although many caribou remained on the calving ground, a slow southeasterly movement was noted. A majority of the Kaminuriak cows were still within the Caribou Protection Area at this time.

Kaminuriak cows left the Caribou Protection Area in late June and moved east towards the Hudson Bay coast via a well-worn system of summer trails along the north shore of the Ferguson River. Occasional trails branched south at preferred water crossing sites especially around Quartzite ($62^{o}25'N$, $94^{o}35'W$) and Happotiyik Lakes ($62^{o}30'N$, $94^{o}20'W$). The trails braided south along the coastal plain toward the Maguse River.

On 1 July, cow-calf groups began to arrive at Maguse River from the north. During the following week most Kaminuriak cows arrived and scattered over the plains north of the Maguse River, between Maguse Lake ($61^{o}40'N$, $95^{o}10'W$) and Maguse Point on the coast. These animals were hunted by Inuit from Eskimo Point at that time. By 7 July, many thousands had crossed to the south side of the Maguse River (G. Alikut pers. comm.). By this time movement of caribou away from the lower Maguse River was well under way. Animals crossed the Maguse River to the south and Maguse Lake to the west, while some

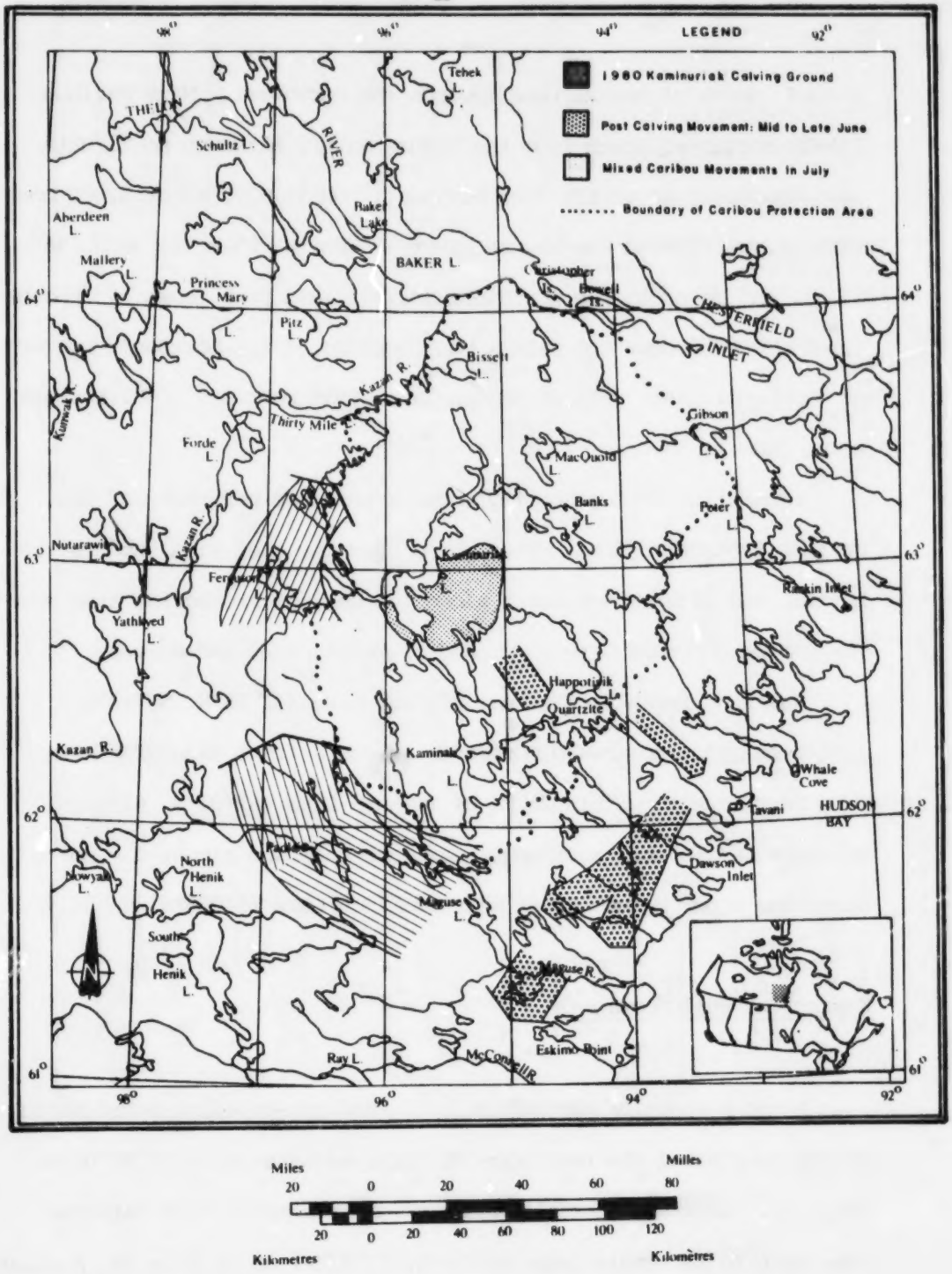

Fig. 6. Post-calving Kaminuriak caribou herd movements in 1980.

passed north of Maguse Lake towards the northwest. Many caribou likely continued south from the Maguse River, although no flights were conducted to verify such movement. On 9 July, about 5,000 cows with calves crossed the Maguse River at Heninga Lake (61°50'N, 96° 25'W), and moved to the northwest (M. Williams pers. comm.). Another large group of cows and calves was observed at the northwest corner of Turquetil Lake, west of Maguse Lake, that same day (M. Kusigak pers. comm.).

Kaminuriak cows generally moved around the periphery of the Caribou Protection Area. They moved down the east side, across the bottom, and later moved north along the Caribou Protection Area boundary. The vanguard groups were comprised of mainly cows and calves.

Numerous fresh trails west of Carr Lake (62°05'N, 95°42'W) indicated major northward movements across a front extending west from Carr Lake to within 25 km of Imikula Lake (62°02'N, 97°40'W). Movement was to the northwest near Carr Lake and almost due north along the upper Maguse River west of Kinga Lake (61°55'N, 96°35'W).

Kaminuriak Bull Movements

Large numbers of Kaminuriak bulls and non-breeders moved north during June along the east side of Yathkyed Lake (62°40'N,98°00'W) (Fig. 7). Groups of 5 to 20 animals were scattered from Yathkyed Lake east to Mackenzie Lake (62°39'N, 95°42'W) on 19 June (M. Kusigak pers. comm.). A large segment of the bull herd moved northeast

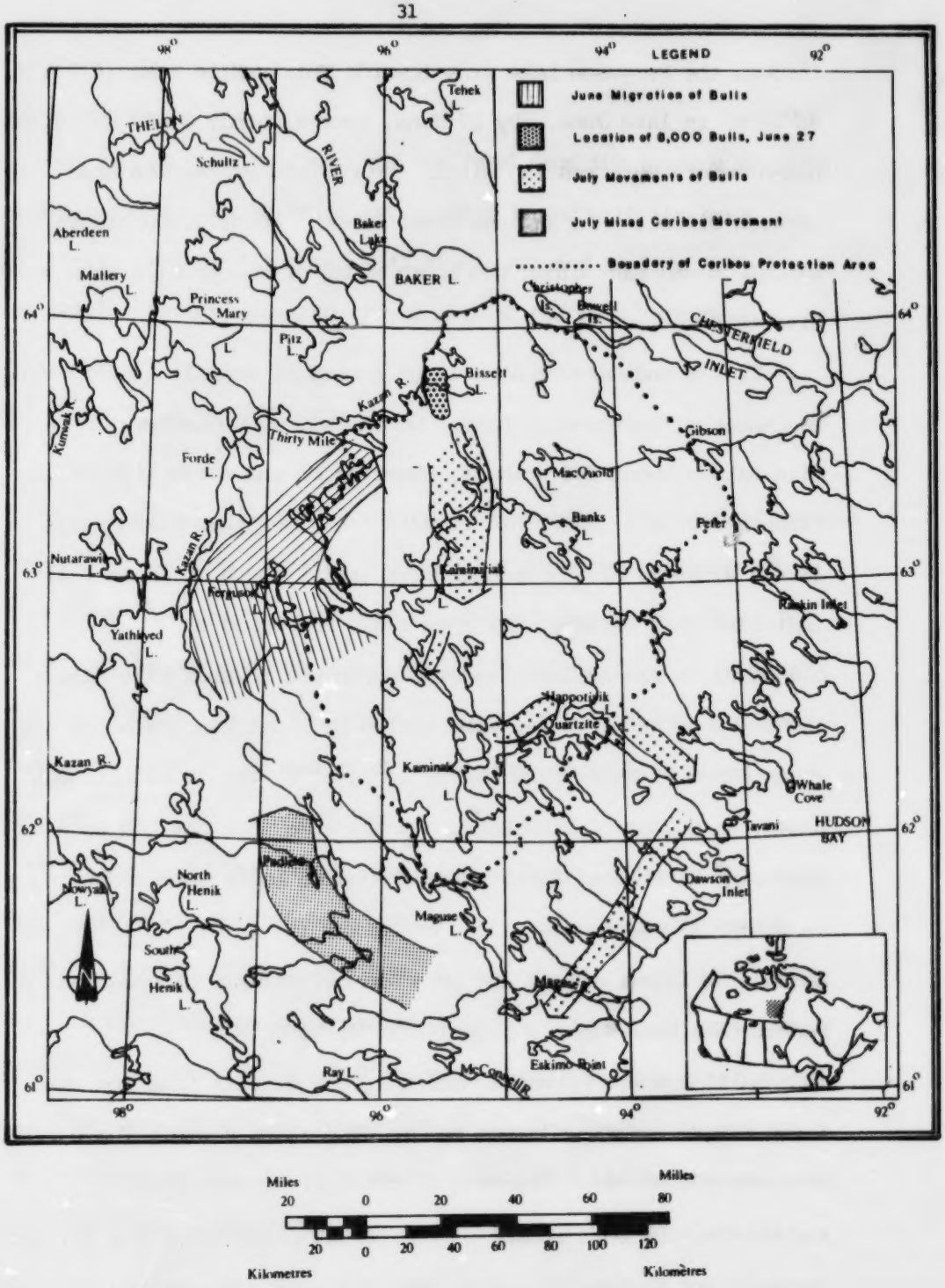

Fig. 7. Movements of Kaminuriak bulls in June and July 1980.

through the Ferguson Lake area towards Thirty-Mile Lake (63°36'N, 96°30'W) in late June. By 27 June, approximately 8,000 bulls and non-breeders were resting within the Caribou Protection Area between Bissett Lake and the Kazan River. About 2,000 others rapidly moved east along the south shore of Thirty-Mile Lake toward Bissett Lake.

Trails indicated that a large number of animals passed within 30 km southeast of Thirty-Mile Lake. No caribou were observed crossing Thirty-Mile Lake. About 300 animals, observed on the north side of the Kazan River on 27 June, had crossed the river near Kazan Falls (63°43'N, 95°51'W). Abundant fresh trails north of Kazan Falls indicated that perhaps more than 1,000 recrossed to the east. A few caribou wandered northwest towards Pitz Lake (64°00'N, 96°40'W); a few were killed by Inuit hunters along the south shore of Baker Lake (64°00'N, 96°00'W) and at Kidertauyak Creek, an outlet of Pitz Lake. At the time that caribou were gathering at Bissett Lake, several hundred bulls were scattered in groups along the west sides of Parker (64°16'N, 115°17'W) and Kaminuriak Lakes. About 200 cows and calves were grouped east of Parker Lake near Blakely Lake (63°15'N, 95°00'W).

Bulls and non-breeders milled around Bissett Lake and the Kazan River for about 1 week before dispersing south. The caribou used designated water crossing #8 (Fig. 1) to move from the west to the east shores of Kaminuriak Lake. Crossing #7, between Ferguson and Kaminuriak Lakes, was rarely used by caribou this year. By 19 July, tracks of about 100 caribou heading south were observed

at this crossing.

Many bull groups followed the cow herd from the Kaminuriak Lake area southeast to Eskimo Point, where they mixed with the cows lingering there. Some bulls moved with the cows, and by late July large mixed caribou groups appeared around Padlei (61°56'N, 96°40'W).

Mixed Caribou Summer Movements

On 23 July, M. Williams observed a mixed herd comprised of approximately 4,000 caribou crossing Maguse River at water crossing #4, just west of Kinga Lake; they were rapidly moving north. About 2 hours later, he saw another mixed herd of 4,000 caribou 20 km north of the water crossing. That evening, approximately 3,000 caribou moving north from the Maguse River were observed in five mixed groups just north of Kogtok River.

On 26 July, 2 mixed herds totalling at least 1,000 caribou were observed south and west of Ferguson Lake (R. Bullion pers. comm.). On 29 July, mixed groups of caribou, totalling approximately 11,000, were partially dispersed just north of Ferguson Lake; one group was comprised of approximately 5,000 animals. These animals moved southeast. They were severely harassed by flies and their dark summer pelage rendered aerial reconnaissance difficult. By early August, many caribou were dispersed in small groups around Kaminuriak Lake.

Further use of water crossing #8 was observed at this time at the narrows just south of Basil Scottie's Outpost Camp located at the north end of Kaminuriak Lake.

Reports of caribou from hunters at Tha'anne River and Maguse Lake (G. Pryznyk pers. comm.), and from the lower Kazan River in mid-August, suggest that caribou were dispersed over a broad area at that time. Darby (1979, 1980) also described wide dispersal patterns of caribou in August.

Designated Water Crossings

Twenty-seven major water crossings were used by the Beverly and Kaminuriak herds. These are shown on the 1980 Caribou Protection Map (Fig. 1). DIAND prohibits mineral exploration activities near the crossings.

No special effort was made to monitor caribou use of water crossings in 1980; however, incidental observations were recorded.

Water Crossings Used by the Beverly Herd

During the spring migration, the Beverly caribou intensively used designated water crossings #22 and #23 at the Thelon Bluffs and

Lookout Point areas, respectively. Both were open water crossings used from early to late May, initially by cows and later by bulls and non-breeders.

During the migration south in early July, the caribou made extensive use of Lookout Point crossing #23 and the Lac du Bois crossing #25. Some use was made of crossing #24 at the mouth of the Clarke River, but many more animals crossed at the mouth of the Hanbury River. A few thousand animals used the Thelon Bluffs water crossing. The Mary Frances Lake crossing also was utilized; scattered groups of bulls were observed at this crossing on 25 July.

In addition to the major Thelon River crossings, many animals crossed the river wherever they encountered it. It is assumed from observations that most Beverly caribou groups were south of the Thelon River by 24 July.

Water Crossings Used by the Kaminuriak Herd

Twelve water crossings were designated by DIAND to be important to the Kaminuriak caribou herd. They were used during the spring by migrating bulls and non-breeders. However, the cows usually reach the calving grounds before ice melt, and hence, do not rely on the water crossing sites.

On 14 July, numerous caribou trails were observed around water

crossing #4 west of Kinga Lake. At that time heavy use of water crossing #5, just west of Heninga Lake, was also noted but the trails were faded, suggesting that they had not been used since the fall of 1979 or spring of 1980. On 23 July about 4,000 caribou were observed using crossing #4 while migrating northwards.

Water crossing #8 is comprised of a series of narrows at the north end of Kaminuriak Lake. A multitude of fresh trails indicated heavy use of two northern sections and of the southwest section located just south of Scottie's Camp. Movements across Kaminuriak Lake occurred in early July; during this period the entire herd dispersed south from the Kazan River and crossed the lake heading east. On 5 August, a small group of caribou was observed crossing near Scottie's Camp, while numerous other groups were dispersed along both sides of Kaminuriak Lake. Caribou winter hair, presumably shed during early summer, was found matted on the rocks at both the north and south ends of crossing #8.

Designated water crossings #9, #10 and #11 near Kazan Falls received limited use in 1980. Baker Lake hunters had reported thousands of caribou crossing there, but the Monitor located only approximately 300 caribou west of the Kazan River. Heavy trails, concentrated a few kilometers west of the river, indicated that either a few thousand caribou had come there for a short time and subsequently recrossed to the east, or that the 300 caribou had generated the large trail systems by milling around for a long period of time.

Land Use in the Beverly Caribou Summer Range

Most of the 1980 mineral exploration activity that was of concern to the Caribou Monitoring Program occurred in and around the Beverly Herd Caribou Protection Area (Fig. 8). Prior to the arrival of caribou on the calving ground, some short term releases to haul fuel and equipment were granted to companies. As post-calving caribou groups moved slowly westward away from the calving ground, increased mineral exploration was permitted. By 10 July, all of the land use permits had been granted; these areas remained open for exploration throughout the summer.

Numerous companies engaged in mineral exploration outside the Caribou Protection Area where no cow/land use interactions were recorded.

Between 15 May and 31 July, eight releases to companies to haul fuel and equipment and 11 releases to occupy camps and work within the Beverly herd Caribou Protection Area were granted. Details of interactions between the Caribou Monitor, DIAND, and companies are reviewed in Appendix IV.

Land Use in the Kaminuriak Caribou Summer Range

Little land use activity was conducted on the Kaminuriak herd range in 1980 (Table 4, Fig. 8). Nevertheless, considerable monitoring was necessary to monitor caribou movements in relation to the few scattered land use operations that did occur. No interactions

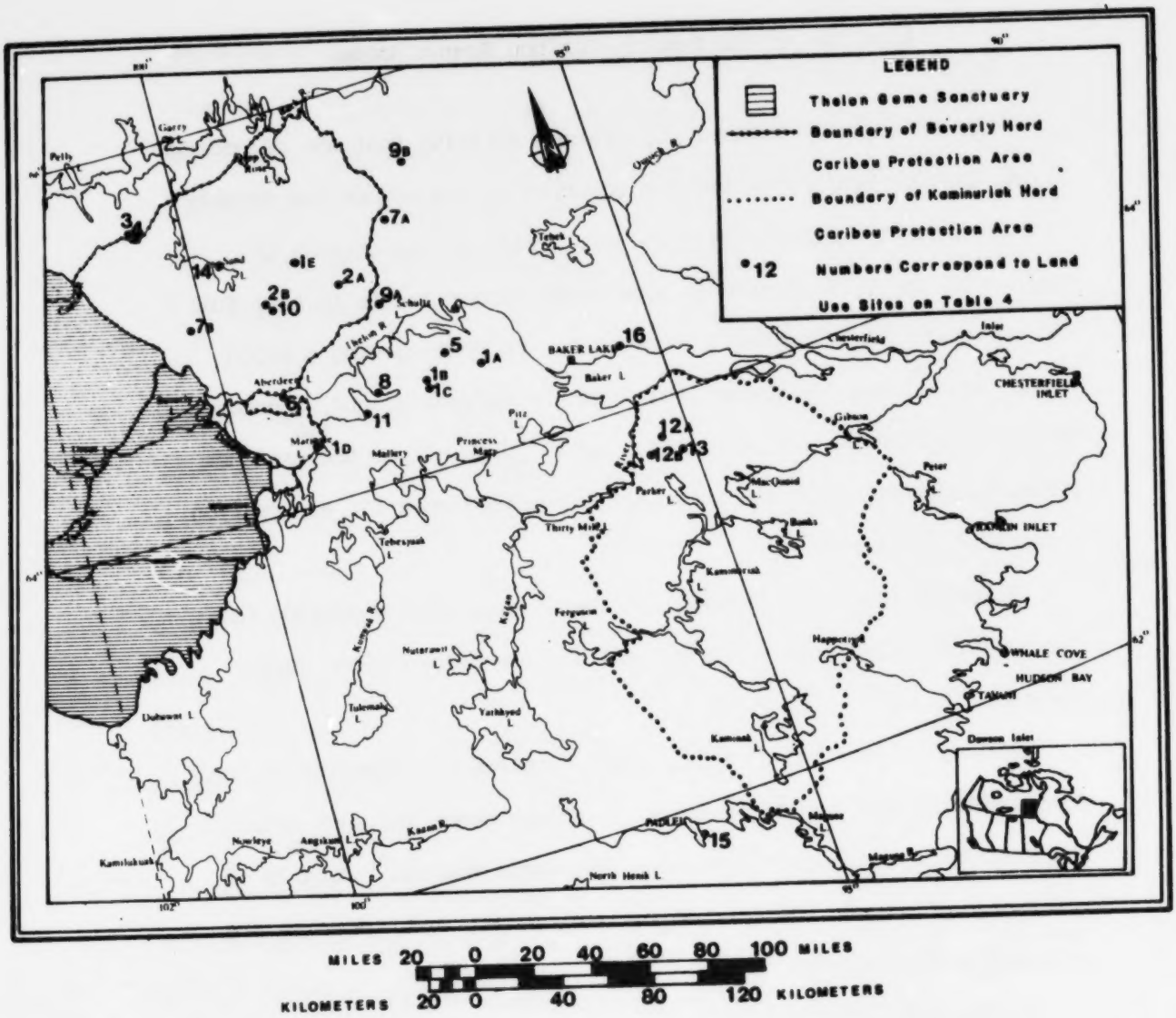
LEGEND
Thelon Game Sanctuary
Boundary of Beverly Herd
Caribou Protection Area
Boundary of Kaminuriak Herd
Caribou Protection Area
12 Numbers Correspond to Land Use Sites on Table 4
BAKER LAKE
CHESTERFIELD INLET
WHALE COVE
HUDSON BAY
MILES 20 0 20 40 60 80 100 MILES
KILOMETERS 20 0 40 80 120 KILOMETERS

Fig. 8. 1980 mineral exploration land use sites near the Beverly herd and Kaminuriak herd calving grounds.

Table 4. Land use activity summary on the summer ranges of Beverly and Kaminuriak caribou, 1980.*

Map reference*	Company name	Type of land use activity	Duration
1A	**U.G.	c,d,e,f	May to Sept.
1B	U.G.	h	May to Sept.
1C	U.G.	c,d,e,f	May to Sept.
1D	U.G.	a,b,c,d,e,f,g,h	May to Sept.
1E	U.G.	a,b,c,d,e,f	June to Sept.
2A	Western Mines Ltd.	c,d,e,f	June to Aug.
2B	Western Mines Ltd.	c,d,e,f	June to Aug.
3	Texasgulf Inc.	a,b,e,f	July to Aug.
4	Union Oil Ltd.	a,e,f	July to Aug.
5	BP Minerals Ltd.	c,d,e,f	June to Aug.
6	Hudson's Bay Oil & Gas Ltd.	a,e,f	June to Sept.
7A	Seru Nucleaire Ltée.	c,d,e,f	June to July
7B	Seru Nucleaire Ltée.	a,b,d,e,f	July to Aug.
8	Cominco Ltd.	a,d,e,f	June to Aug.
9A	Essex Minerals Co.	b,c,d,e,f,g,h	March to May
9B	Essex Minerals Co.	b,c,d,e,f	July to Aug.
10	Canadian Nickel Co. Ltd.	a,b,c,d,e,f	July to Aug.
11	Marlene Oil Corp.	b,c,d,e,f,g,h	July to Aug.
12A	Pan Ocean Oil Ltd.	c,d,e,f,g,h	May to Sept.
12B	Pan Ocean Oil Ltd.	h	June to Sept.
13	Noranda Exploration Co. Ltd.	b,c,e,f,h	July to Aug.
14	Comaplex Resources Int. Ltd.	a	June
15	St. Joseph Explorations Ltd.	c,h	Apr-May, July
16	Geological Survey of Canada	c	June to Aug.

* Refer to Figure 8

** Abbreviation "U.G." = Urangesellschaft Canada Ltd.

a Air geophysics
b Reconnaissance geochemistry
c Ground geophysics
d Ground geochemistry
e Geology
f Prospecting
g Trenching
h Diamond drilling

between caribou cows and land use activities were recorded. Since locating the cows was difficult from late June until the end of July, most caribou movements were recorded from tracks. Monitoring of land use sites south of the Caribou Protection Area during July was not comprehensive due to the limited flying time available to the Monitor, the widespread dispersal of caribou, and tne logistical problems associated with aircraft charters. The details of company requests for land releases from DIAND, and the corresponding advice submitted to DIAND by the Caribou Monitor, are discussed in Appendix IV.

Other Land Use Sites

Numerous companies conducted exploration outside of caribou concentration areas and the Caribou Protection Areas. Some sites were monitored while ferrying to and from areas of concern. Others were situated outside occupied caribou range and were identified only through interviews with pilots and exploration company personnel in those areas. These sites are listed in Appendix IV.

Disturbance

Caribou/Land Use Interactions - 1980

No significant encounters between caribou cow-calf groups and mineral exploration programs were observed by the Caribou Monitor, nor were any reported to him. Urangesellschaft Canada Ltd. biologists

reported small groups of caribou passing their study areas throughout the summer. In each case, the caribou apparently passed by and continued on their migration routes.

The only major caribou/land use interaction occurred between Bissett Lake and the Kazan River. Approximately 8,000 Kaminuriak bulls and non-breeders, which were segregated from the cow-calf segment, entered the area from the southwest about 26 June. The herd remained there for a few days. This site was the northernmost point in their spring migration. A Pan Ocean Oil Ltd. drill camp and several diamond drills were established in the area. Operations continued because caribou bulls were not protected by the Caribou Protection Measures. The reaction of caribou to helicopters, camps, diamond drills and land crews was described by Pan Ocean personnel as one of casual avoidance and collective disregard. It was reported that caribou drank from the salt water tank at one drill site.

Caribou reaction to a Beaver aircraft (300 m AGL) was observed on a monitoring flight on 27 June. There was no visible movement of the resting bulls and non-breeders. However, cows nearly always reacted to the Beaver aircraft, either by changing direction, quickly standing up from a bedded position, or initiating panicked running. Nonetheless, J. Scottie, the DIAND Land Use Inspector from Baker Lake, advised Pan Ocean Personnel to avoid helicopter slinging or other low level flying over the bull caribou.

Other Disturbances to Caribou

Near the end of July, caribou were disturbed by flies. They reacted violently by running, shaking and standing in, or stampeding through, shallow ponds or rivers.

Inuit hunters from Baker Lake killed up to 350 of the bulls and non-breeders near the Kazan River after their arrival there in late June. An undetermined number of others were killed along the south shore of Baker Lake from the same population. The cow segment, and subsequent mixed caribou aggregations, were hunted by Inuit hunters of Eskimo Point along the lower Maguse River and Maguse Lake area when the herd arrived there in early July.

RECOMMENDATIONS

1. The caribou monitoring aircraft should be a Cessna 185 rather than a Beaver. Advantages are:

   - greater speed capability
   - increased fuel economy
   - reduced charter rates
   - increased observer comfort and visibility
   - lower noise levels, resulting in reduced wildlife disturbance and observer fatigue.

   Wheel-skis should be used prior to breakup and floats afterwards.

2. The monitoring flight report form should be re-drafted to include space for comments and recommendations. An additional comment page and a map (scale 1:3,000,000) of either Beverly or Kaminuriak areas is also recommended.

3. Monitor flight report forms should be filled out and submitted in duplicate to the DIAND Land Use Inspector at Baker Lake. The copy should be forwarded to the DIAND District Manager in Rankin Inlet immediately following each flight.

4. The Caribou Monitor should hire, from among Baker Lake Inuit residents, a monitoring assistant capable of assisting on long flights throughout the summer. The Monitor should train this person as an observer and involve him or her in public relations.

5. The Caribou Monitor should liaise with the local public and industry to obtain information about caribou, promote public awareness and involvement, and distribute information about the Monitoring Program. Interviews, camp visits, participation at various meeetings, radio broadcasts, and bulletin board announcements are a few of the methods available to the Monitor.

6. DIAND should make their helicopter available to the Monitor to occasionally conduct flights when other aircraft are not available.

7. Interim report submission deadlines should be extended for 10 days after the day of the last monitoring flight.

8. A paper briefly discussing the natural history of caribou, including life cycle, productivity, population and associated limiting factors, the effects of stress, migration routes, Inuit relationships with caribou, etc., should be compiled and distributed when land use permits are issued. Information should apply to the Beverly and Kaminuriak herds, and should be updated annually.

ACKNOWLEDGEMENTS

I am thankful for the administrative assistance provided by Anne Gunn, John Donihee, Ed Bowden, Cormack Gates, and Doug Urquhart during the 1980 monitoring season.

Roy Bullion, Baker Lake Wildlife Officer, and Barnabas Peryuaq, a member of the Baker Lake Hunters and Trappers Association, contributed considerable time and effort as observers on most monitoring flights.

DIAND Land Use Section personnel, Joan Scottie, Jim Umpherson and Mike Kusagak, assisted the monitoring program by providing guidance, liaison with exploration companies and information.

The Hamlet of Baker Lake provided a comfortable home base and much information, interest, and logistical support.

PERSONAL COMMUNICATIONS

Alikut, G., Assistant Wildlife Officer, Eskimo Point, N.W.T.

Bubier, J., Canoeist.

Bullion, R., Wildlife Officer, N.W.T. Wildlife Service, Baker Lake, N.W.T.

Decker, R., A.L.U.R. Technician, N.W.T. Wildlife Service, Yellowknife, N.W.T.

Gunn, A., Wildlife Biologist, N.W.T. Wildlife Service, Yellowknife, N.W.T.

Pangman, J., Biologist, Urangesellschaft Canada Ltd., Toronto, Ontario.

Pryznyk, G., Wildlife Officer, N.W.T. Wildlife Service, Rankin Inlet, N.W.T.

Williams, M., Wildlife Technician, N.W.T. Wildlife Service, Yellowknife, N.W.T.

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APPENDIX I

Caribou Protection Measures 1980

CARIBOU PROTECTION MEASURES 1980

CARIBOU PROTECTION AREAS

1. (a) The Permittee shall not, without approval, conduct any activity between May 15 and July 31 within the Caribou Protection Areas depicted on the map certified by the Engineer as the "Caribou Protection Map 1980", annexed to this Land Use Permit.

(b) A Permittee may, upon approval by the Land Use Inspector, operate within the said Caribou Protection Areas beyond the May 15 deadline set out in 1(a), provided that when monitoring information indicates that caribou cows are approaching the area of operation, the Permittee will implement 1(c).

(c) On cessation of activities pursuant to 1(a) or 1 (b), the Permittee will remove all personnel from the zone who are not required for the maintenance and protection of the camp facilities and equipment.

(d) The Permittee may commence or resume activities prior to July 31 within those parts of the Caribou Protection Areas released by the Land Use Inspector for the reason that caribou cows are not expected to use those parts for calving or post-calving (note 1).

CARIBOU PROTECTION GENERAL

2. (a) In the event that caribou cows calve outside of the Caribou Protection Areas, the Permittee shall suspend operations within the area(s) occupied by cows and/or cows and calves between May 15 and June 30.

(b) In the event that caribou cows and calves are present outside of the Caribou Protection Areas, the Permittee shall suspend the following operations within the area(s) occupied by cows and calves between July 1 and July 31.

(i) airborne geophysics surveys at an altitude of less than 300 metres above ground level.

(ii) slinging of fuel or equipment by helicopter at an altitude of less than 300 metres above ground level.

CARIBOU PROTECTION MIGRATION

3. (a) During spring migration of caribou, the Permittee shall not locate any operations so as to block or cause substantial diversion to the migration.

(b) The Permittee shall cease activities that may interfere with spring migration, such as airborne geophysics surveys or movement of equipment, until the migrating cows have passed.

CARIBOU CROSSINGS

4. The Permittee shall not, between May 15 and September 1, conduct any operation within 5 km of any "Major Crossing Site" as outlined on the map certified by the Engineer as the "Caribou Protection Map 1980", and annexed to this Land Use Permit.

5. The Permittee shall not, between May 15 and September 1, construct any camp or conduct any blasting within 10 km of any "Major Crossing Site" as outlined on the map certified by the Engineer as the "Caribou Protection Map 1980" and annexed to this Land Use Permit.

NOTE

1. The Land Use Inspector's decision will be made on the basis of the existing caribou monitoring information.

2. Concentrations of caribou should be avoided by low level aircraft at all times.

APPENDIX II

Caribou Monitoring Program Fuel Caches

Appendix II Caribou Monitoring Program Fuel Caches

There are presently 4 caches of 100/130 avgas available for use by the Caribou Monitoring Program. They are situated at:

Aberdeen Lake: 64°37'N., 99°45'W on the north shore (10 drums).

Grassy Island: 63°36'N., 99°45'30"W. on the south shore (about 5 drums).

Hoare Lake, Hanbury River: 63°35'20"N., 105°09'W. (2 drums).

The latter two caches were established by the N.W.T. Wildlife Service, A.L.U.R. program. Arrangement should be made with the A.L.U.R. technician for their use.

Future monitoring would be greatly facilitated in the Kaminuriak herd area by the establishment of a fuel cache. A good spot is at Kaminak Lake (62°20'30"N., 95°03'W) on the shore of a sheltered bay. About 12-45 gallon drums of 100/130 avgas and 3-45 gallon drums of Turbo B or JP4 turbine fuel would be adequate for a year's monitoring.

APPENDIX III

Flight Report Form

FLIGHT REPORT FORM - D.I.A.N.D.

☐ Kaminuriak ☐ Beverly Date:_____

Aircraft_____ Pilot_____IFR Yes/No

Redar Altimeter_____ GNS_____Weather:Cloud_____

Wind: Speed/Direction _____Temperature_____Visibility_____

% Snow Cover_____Lakes/Rivers Frozen_____

Comments_____

_____

_____

Survey Type:_____

1. Reconaissance_____ 2. Transects (line, strip width)_____
   Other_____

Altitude(s)_____Air Speed_____

Duties of observers(Names)

1. Navigate_____
2. Write Obs._____
3. Tape Obs._____4. Observe Only_____
5. Photograph_____

Distance Flown_____Hours Flown_____

Location(s): Maps Used NTS 1:250,000_____

_____

1:1,000,000 submitted_____

Vegetation types: trees, treeless tundra, shrubby tundra, dwarf shrub (< 50 cm) tundra_____

Number and Type of data sheets attached:_____

_____

Proposed next aerial survey and/or ground observations_____

_____

_____

FLIGHT REPORT FORM

Comments on survey and caribou activity_____

_____

_____

_____

_____

_____

_____

_____

Water Crossings noted_____

_____

Human Activities Noted_____

_____

Aerial/ on ground_____

_____

Submitted By_____ _____

Signature (s) Date

APPENDIX IV

Requests for Release of Land Use Sites in Beverly and Kaminuriak Caribou Summer Ranges in 1980.

Land Use on the Beverly Caribou Herd Summer Range

Urangesellschaft Canada Limited (U.G.)

On 30 April U.G. requested a release from DIAND to haul drill equipment from 20 to 25 May from their old camp, 37 km east of Sandhills Lake (65°17'00"N, 98°22'20"W), to Long Lake (later changed to Marjorie Lake). The Monitor advised DIAND not to release the area until 23 May. U.G. hauled the drill to Marjorie Lake on 23 and 26 May. On 22 May, U.G. requested a release for the northwest corner of Marjorie Lake, located just inside the Caribou Protection Area. This was granted on 26 May, after the Monitor determined that caribou were not entering the area. The camp was constructed on 3 and 4 June.

U.G. informed DIAND on 7 May of plans to mobilize a camp on about 14 June at Big Lake (63°13'N, 98°38'W), located 15 km east of Sandhills Lake. The move was prevented, on the Monitor's advice, because of its proximity to calving caribou. During early June, DIAND again requested the Monitor's advice concerning caribou activity in this area. On 18 and 24 June, the Monitor advised that closure be maintained pending verified caribou movement away from the area. At this time, some caribou drifted slowly to the south-west, but many remained within 7.5 km of the proposed camp, a distance which the caribou could travel in about 1.5 days. DIAND did release U.G. on 24 June but only to haul fuel, wood and camp gear into

Big Lake; they were not given authority to set up the camp. A short-term release was considered acceptable, and additional monitoring to detect caribou movements was conducted.

On 27 June the Monitor recommended to DIAND the release for occupancy of U.G.'s camp at Big Lake. A monitoring flight on 26 June established a definite southwest movement of large post-calving groups. The Monitor did not believe the caribou would return to the Sandhills Lake area. U.G. continued to operate within the Caribou Protection Area at Marjorie Lake and Big Lake for the rest of the summer.

Texasgulf Inc.

DIAND received release requests from Texasgulf Inc. in May, 1980 to haul 150 drums of fuel to their campsite south of Pelly Lake ($65^{O}55'N$, $101^{O}20'W$), just outside the Caribou Protection Area. On 23 May the Monitor recommended a short term release for the Sand Lake area (including the Texasgulf site) to permit fuel hauls by several companies. This release was reconfirmed on 26 May. However, Texasgulf did not haul their fuel at that time.

Texasgulf's expeditor in Yellowknife (W. Laserich) contacted DIAND and the Monitor on 8 June to enquire about caribou distribution. The Monitor advised DIAND that the area was within the occupied calving ground of the Beverly herd and that calving was in progress. DIAND informed W. Laserich and J. Heslop of Texasgulf Inc. that the area was closed.

On 8 July, Braden-Burry Expediting of Yellowknife requested an update from DIAND on the caribou movements and requested permission to establish Texasgulf's Camp. The area was surveyed on 9 July and was recommended for release on 10 July.

Union Oil Company of Canada Ltd.

Braden-Burry Expediting of Yellowknife requested a release on 8 June to establish a Union Oil Camp on the boundary of the Caribou Protection Area near the Texasgulf camp ($65^{o}31'N$, $101^{o}31'W$). This site was located within the 1980 Beverly calving grounds. Permission was denied on the advice of the Monitor until 10 July; a release was granted at that time. On 24 June, J. Schindler of Union Oil requested a release for 15 July to occupy their camp. The site was not released at this time because caribou movements were unpredictable.

Western Mines Limited

On 1 May Western Mines applied to DIAND for a release to commence land use activities about 1 June northwest of Schultz Lake. This site was located within the Caribou Protection Area ($65^{o}03'N$, $98^{o}21'W$). Following a 25 May monitoring flight, the Monitor advised DIAND that cow groups were far to the west and southwest of Sand Lake. DIAND released the Western Mines site on 26 May. Western Mines Ltd. applied to DIAND on 9 June for a release to establish several camps south of Sandhills Lake. DIAND advised that

work could commence in about 2 weeks from this date. The Monitor's advice was to withhold release of the area close to the calving herd (including Sandhills Lake); however, DIAND disregarded the advice and released it. The Monitor was not informed of this action and company work began 20 June at Sandhills Lake. It was not until 27 June that the Monitor had documented caribou movements away from the land use site within the calving ground and release was advised.

Hudson's Bay Oil and Gas Ltd. (H.B.O.G.)

On 22 May, T. Brown of Hudson's Bay Oil and Gas Ltd. requested permission to conduct fuel hauls during the following week. Cache sites were located at Sand Lake (50 drums). The Monitor advised DIAND that few caribou were in either area and that reconnaissance flights did not suggest that the caribou would move into these areas. DIAND released the sites. This release carried the condition that work be first completed at Sand Lake because caribou usually enter that area for calving in early June.

DIAND received a request from T. Brown on 27 May to conduct helicopter-supported ground geology survey work near the north shore of Aberdeen Lake. DIAND granted the release; work was conducted for at least a week or until the caribou movements dictated the area's closure. The company was advised to work the western sections first as it was known that caribou would migrate into the calving ground from that direction. J. Wittstock, the geologist, was again briefed on the caribou situation just prior to commencement of the field program.

T. Brown advised DIAND on 9 June of a small camp located 7 km north of Aberdeen Lake. At this time DIAND informed H.B.O.G. that major mobilization of personnel would not be permitted pending monitoring of post-calving caribou movements.

H.B.O.G. applied for the release of a new campsite on the shore of Aberdeen Lake on 3 July. The previous campsite, 16 km north of the lake, had proven unsuitable. DIAND informed them that they could select a new campsite on the condition that they would not establish it in the area of restricted activity surrounding water crossings (10 km radius). This release was granted on 11 July and the land use permit was amended to include a campsite on Whale Island ($64^{o}36'30"N$, $99^{o}21'00"W$). Since few, if any, caribou were observed in the vicinity of Aberdeen Lake and it did not appear that the calving herd was approaching, the Monitor recommended that releases in the area continue during the post-calving period. No closures occurred in this area throughout the summer, 1980.

Seru Nucleaire Ltée

On 5 May, K. Schimann of Seru Nucleaire Ltée requested a release to begin operations on 1 June at Sand Lake. DIAND did not grant the release because Sand Lake was in the area most heavily used by calving caribou in June 1979. It was believed that this location would be heavily used during the 1980 season.

DIAND received a request for release on 22 May from Seru Nucleaire to mobilize a major haul to five sites in and near the Beverly Caribou Protection Area:

1. Sand Lake -- 3 DC-3 loads of fuel.
2. West end of Aberdeen Lake -- 2 loads.
3. Twin Lakes SW of Sand Lake (65°10'N, 100°05'W) -- 1 load.
4. Princess Mary Lake -- 2 loads.
5. Southwest of Amer Lake (65°15'N, 97°45'W) -- 5 loads.

DIAND granted this release on 23 May on the Monitor's advice with the condition that the Sand Lake area work be completed first in order to avoid the calving herd. The transfer of fuel off the ice of Sand and Twin Lakes by helicopter was completed on 3 June.

Post-calving caribou movements took the cow herd out of the Caribou Protection Area in early July. On 10 July the Monitor reported to DIAND that few caribou remained on the calving ground and recommended that land use operations could commence. Seru Nucleaire was granted a release on 21 July to erect and occupy a camp southwest of Sand Lake (65°02'N, 100°17'W) beginning on 24 July.

Comaplex Resource Int. Ltd.

Comaplex planned to work within 20 km of Sand Lake beginning 1 June. A company representative, G. Dickson, requested a release for 21 May. The Monitor advised DIAND to withhold the release for 1 week in order to allow time for a reassessment of the caribou movements and distribution.

Dickson also inquired about a release to cache 51 drums of fuel. A release was granted on 22 May because there were few caribou in

the vicinity of Sand Lake. Fuel was moved onto the site in late May by DC-3, and by helicopter on 3 June.

On 2 June DIAND, on the advice of the Monitor, again informed Comaplex Resources that a release would not be granted to conduct long-term work other than fuel caching near Sand Lake because the caribou cow herd was only 23 km away and could move closer at any time. Similar conditions prevailed on 13 and 16 June; DIAND informed Dickson that a release would not be granted.

The Monitor advised DIAND to maintain a closure in the Sand Lake area during June and early July. By 8 July the Monitor determined that the caribou had moved away from the calving ground, and at that time recommended the release of Sand Lake land use sites. Release was granted by DIAND on 11 July.

Canadian Nickel Co. Ltd.

This company planned to work near Sahara Lake, located just south of Sandhills Lake. This area had been open since 24 June when DIAND granted a release to Western Mines. The Monitor advised DIAND to maintain closure status until 27 June. The company applied for and was granted a lease on 9 July; the Sahara Lake site was occupied on 10 July.

Marlene Oil Corporation

This company began operation on 6 July at the southeast corner of

Aberdeen Lake (64°30'N, 98°50'W). This site was located outside the Caribou Protection Area and far from occupied caribou range. No closures were enforced by DIAND.

Cominco Limited

Cominco Ltd. operated a camp throughout the summer on the east arm of Aberdeen Lake outside the Caribou Protection Area. This area was not used by cows during the calving or post-calving periods. No closures were enforced by DIAND.

Land Use on the Kaminuriak Caribou Herd Summer Range

Pan Ocean Oil Ltd.

Pan Ocean maintained a large camp at Martell Lake above Bissett Lake and a drill camp approximately 7 km northwest of Bissett Lake (Fig. 6). Two diamond drills operated both west and east of Bissett Lake throughout June and July at 5 sites within the Caribou Protection Area.

In early May, Pan Ocean Oil Ltd. requested a release to work in the Caribou Protection Area beyond the 15 May deadline. From monitoring flights on 12 and 14 May, the Monitor determined that the Kaminuriak cow herd was not approaching the Martell Lake area, a traditional post-calving area. The caribou were expected to remain near Kaminuriak Lake to calve. Therefore, on 15 May the Monitor recommended a release of Pan Ocean's land use activity.

The Kaminuriak herd's cow segment was monitored by N.W.T. Wildlife Service personnel during a calving ground census program in early June. No northward movements of caribou occurred during the calving and early post-calving period; on 10 July the Monitor recommended to DIAND that the Pan Ocean Oil Ltd. land use operation be permitted to continue.

A large segment of the Kaminuriak bull herd converged on the area just west of Bissett Lake about 27 June. Because the Caribou Protection Measures cover only the cow-calf segment of the herd, no action was taken by DIAND.

During the post-calving period, cows moved off the calving grounds in a southeast direction. They did not approach Pan Ocean's sites at any time during the post-calving period.

Pan Ocean Oil Ltd. maintained a camp southwest of Yathkyed Lake from May to September, 1980. This is west of the present summer distribution of Kaminuriak caribou and was not utilized by cows.

Noranda Exploration Co. Ltd.

On 19 June, Noranda applied to DIAND for a release to begin diamond drilling just east of Bissett Lake on or before 15 July. The Monitor advised that no interactions were imminent and that Noranda should be granted the release. The company began operations on, or after, 20 July.

Esso Minerals Ltd.

Esso Mineral Ltd. maintained a camp at Ameto Lake near South Henik Lake, south of the Caribou Protection Area. Occupancy of the camp and land use activity began about 15 July. Some post-calving groups moved through the Padlei area about 40 km northeast of Ameto Lake ($61^{o}40'N$, $97^{o}20'W$). Esso personnel observed a group of several thousand caribou there. The area in the immediate vicinity of Ameto Lake was not monitored.

St. Joseph Explorations Ltd.

St. Joseph Explorations Ltd. maintained a camp on the southeast side of Heninga Lake approximately 147 km northwest of Eskimo Point from 28 March to 27 May, 1980 and for 2 weeks during midsummer. During July, some caribou groups, numbering in the thousands, periodically moved northwest through the Heninga Lake area. St. Joseph's activities at that time consisted of small-scale ground geophysical surveys.

O'Brien Energy & Resources Ltd.

This company worked at Cullaton Lake west of Henik Lakes during the summer of 1980. The area was not monitored and no report of significant caribou numbers was received during the post-calving period. Evidence indicated that most Kaminuriak caribou summered closer to the coast of Hudson Bay.

Other Land Use Sites

1. B.P. Minerals Ltd. south of Schultz Lake.
2. Essex Minerals Ltd. at Rumble and Arner Lakes.
3. Geological Survey of Canada at Twin River on Baker Lake and two camps east of Dubawnt Lake.
4. Urangesellschaft Canada Ltd. south of Schultz Lake, at Marjorie, Kamilukuak and Mosquito Lakes.
5. Cominco Ltd. at the east end of Aberdeen Lake and near Carruthers Lake.
6. Comaplex Resources Int. Ltd. at Longspur Lake south of Princess Mary Lake.
7. Marlene Oil Corp. at Aberdeen Lake's east end and west of Tebesjuak Lake.
8. Pan Ocean Oil Ltd. southwest of Yathkyed Lake and near Nutaraivik Lake.
9. Noranda Exploration Co. Ltd. near Yathkyed and Carruthers Lakes.
10. Seru Nucleaire Ltée. southwest of Arner Lake.
11. O'Brien Energy and Resources Ltd. at Cullaton Lake.
12. Esso Minerals Ltd. at Arneto Lake.
13. PNC Exploration (Canada) Ltd. near Trebell, Otter, and Henik Lakes.
14. E. & B Explorations Ltd. at Heninga Lake.
15. St. Joseph Explorations Ltd. at Heninga Lake.
16. Texasgulf Inc. near Mosquito Lake.

APPENDIX V

1980 Designated Water Crossings

1980 Designated water crossings,
Beverly and Kaminuriak caribou herds.

Crossing	Location [a]
1	North of Roseblade Lake
2	South of South Henik Lake
3	Henik Lakes Narrows
4	Northwest Kinga Lake
5	Maguse River
6	Mackenzie Lake
7	West Kaminuriak Lake
8	North Kaminuriak Lake
9	Kazan Falls
10	Kazan River above the Falls
11	Thirty Mile Lake area
12	Christopher Island
13	Thelon River
14	East Schultz Lake
15	West Schultz Lake
16	West Qamanaarjuk Lake
17	East Aberdeen Lake
18	East Central Aberdeen Lake
19	Central Aberdeen Lake
20	West Aberdeen Lake
21	Dubawnt River
22	East Thelon Sanctuary
23	Centre Thelon Sanctuary
24	West Thelon Sanctuary
25	Lac du Bois
26	Mary Frances Lake
27	Lockhart River

a Refer to Fig. 1.